To Mrs Rathbun, Aug. 1900

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16. *The Crustaceans of the Caves of Kentucky and Indiana;* by S. I. Smith.—Through the courtesy of Dr. Packard of Salem, Mass., I have recently been enabled to examine the types of his *Crangonyx vitreus* from near Orleans, Ind., and also several specimens of an amphipod collected in Mammoth Cave by himself. All the specimens from Mammoth Cave are of a single species, which, there can be little doubt, is really the *Stygobromus vitreus* unintelligibly described from the same locality by Professor Cope. The species is really a *Crangonyx* and it should stand as *C. vitreus*, although very different from the one from Indiana which is referred to Cope's species by Dr. Packard and by him called *C. vitreus*. It is a small species, the largest specimen being less than a fourth of an inch (5·2 mm.) long, apparently wholly eyeless, and remarkable for the rudimentary character of the unibranched posterior caudal stylets, which are shorter than the telson. It seems to be near the typical species described by Bate, and it is closely allied in some respects to *C. tenuis*, also an apparently eyeless species, which I have described from wells at Middletown, Conn. Since this note was first written, I have examined several specimens of this last species, collected by Mr. J. K. Thacher, under stones in a small brook, near New Haven. From this it seems not at all improbable that the allied species from Kentucky and Indiana—and very likely also the eyeless, cave species of other groups—may still be found in the surface streams of the same region.

The specimens of Dr. Packard's species from Indiana are badly preserved but are sufficient to show that the species is very closely allied to *Crangonyx gracilis*, from Michigan, Lake Superior, etc., differing principally in the structure of the eyes, which are well developed and abundantly supplied with black pigment in *C. gracilis*, while in Dr. Packard's specimens they are observable with difficulty, are wholly without black pigment, are undoubtedly colorless in life, and are probably only imperfect organs of vision, although the structure of the facets can be distinctly made out.

The other differences are all very slight, scarcely sufficient to distinguish the subterranean form as a species, and certainly so slight that they would almost surely be overlooked if the two forms were found together.

As the crustaceans have recently been several times referred to as indicating the partially marine origin of the cave fauna of the Western States, a word in regard to their affinities may not be out of place. The species already described from Indiana and Kentucky are the following: *Cambarus Bartonii* Erichson, Mammoth Cave; *C. pellucidus* Erichson, caves in Ky. and Ind.; *Crangonyx vitreus* Smith, Mammoth Cave; *C. Packardii* Smith, wells, Ind.; *Cæcidotea stygia* Packard, caves and wells, Ind., and Mammoth Cave; *Euphiloscia Elrodii* Packard, caves, Ind.; *Cauloxenus stygius* Cope, caves, Ind. The genus *Cambarus* is strictly confined to American fresh waters, and *C. Bartonii* is one of the commonest species in the streams of the Western States. *Crangonyx*, as far as known, is wholly confined to fresh water. *Cæcidotea*, as far as we can judge from description and figures, is scarcely distinguishable, except in wanting eyes, from *Asellus*, a characteristically fresh water genus. The *Euphiloscia* was found also outside the caves and is allied to other terrestrial genera. The *Cauloxenus*, a Lernæan parasite of the blind fish, is so poorly described and figured, and the genera of the whole group to which it belongs are so difficult and imperfectly known, that it is useless to speculate on its exact affinities. In our Western and Southern States, species of perch, brook trout, the siscowet, lake white-fish, species of *Catostomus* and *Pomotis*, and other fresh water fishes, are infested with different species of Lernæans, and there is no more reason for regarding *Cauloxenus* as a "marine form" than any of these parasites. As well might we call a *Cambarus* or a *Crangonyx* a marine form because the great majority of the species of the orders to which they belong are marine. Considering the crustaceans alone, I can see no reason for supposing that the fauna of the caves of Kentucky and Indiana has been derived from any other source than the recent fauna of the surface of the neighboring region.